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REMARKS

In the Official Action, claims 2, 4-8, and 21-23 were rejected. No rejection was provided for claims 24-33. Therefore, claims 24-33 are believed in condition for allowance. By the present Response, claims 2, 4, 6, and 21 have been amended. Upon entry of the amendments, claims 2, 4-8, 21-33 will be pending in the present patent application. Reconsideration of the rejection and allowance of all pending claims are respectfully requested.

Claim Objections

Claim 6 was objected to as being of improper dependent form. In addition, claims 6 and 21 were objected to because of informalities. Applicants have reviewed the Examiner's objection and amended the claims. Applicants respectfully assert that the claims, as amended, render the Examiner's objection moot. Withdrawal of the claim objections is respectfully requested.

First Rejection Under 35 U.S.C. § 112

Claims 4-8 and 22 were rejected under 35 U.S.C. § 112, second paragraph, for containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the invention was filed, had possession of the claimed invention. Specifically, the Examiner stated that:

In Claim 6, the combination of steps C and B of "continuously winding the plurality of segments" (line 7) simultaneously or at the same time during "rotating at least one of the plurality of segments" (line 5) is new matter. The specification, as originally filed, does not provide support for continuously winding the plurality of segments simultaneously while rotating the plurality of segments and a wire dispenser relative to each other. The specification does not even define the term "continuously" and what is

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encompassed by winding all of the segments together
"continuously".

With respect to the Examiner's comments, it appears the Examiner is actually referring to claim 4, rather than claim 6 and although Applicant's disagree with the Examiner, claim 4 has been amended in light of the Examiner's comments. The amendments to claim 4 do not narrow the scope of the claim. Withdrawal of the rejection to claims 4-8 and 22 under 35 U.S.C. § 112, second paragraph, is respectfully requested.

In addition, claims 2, 6, and 23 were rejected under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter the Applicants regard as the invention. Specifically, the Examiner has rejected the claims for the use of the variables "N" and "M" as being unclear and confusing.

Claim 2 has been amended in light of the Examiner's comments. The amendment to claim 2 does not narrow the scope of the claim. In addition, Applicants respectfully assert that the use of the variable "N" to reference both the number of phases of an electromechanical device as well as the number of segment sets within the said device is neither confusing nor unclear to one of ordinary skill in the art. As defined in the present application, a device with N phases has N segment sets. For example, a three-phase device, as defined by the instant application, has three segment sets. Because the number of segment sets is equal to the number of phases of the device as presented in the application, the use of the identifier "N" for both the segment sets and device phase would not be confusing or unclear to one of ordinary skill in the art. Accordingly, withdrawal of the rejection to claims 2, 6, and 23 under 35 U.S.C. § 112, second paragraph, is respectfully requested.

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First Rejection Under 35 U.S.C. § 103

Claims 2 and 4-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Searle, U.S. Patent No. 4,350,914, in view of Varley, U.S. Patent No. 1,073,059. The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Claims 2 and 4-6 are patentable because the cited references, either alone or in combination, do not teach, disclose, or suggest all of the recited features of the claims. Some of the recited features of amended independent claim 2 that are not taught, disclosed, or suggested by the cited reference are:

(A) winding N sets of stator segments, each set corresponding to a phase of the electromechanical device and each segment defining a bobbin, the N sets of segments being wound with a single continuous length of wire for each set such that the segments of each set are electrically in series.

In the Official Action, the Examiner stated that:

Searle teaches that the electromechanical device has 3 phases (see col. 4, lines 52-60) with 12 wound segments or bobbins 2. One set of segments is read as being equal to four segments or bobbins 2. As shown in Figure 3, Searle forms three sets of four segments for a total of twelve segments (bobbins 2). Accordingly, Searle can be said to wind one segment of four segments separately from the other two remaining sets of four segments, to combine all three sets of segments into the common circular arrangement shown in Figure 3.

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The Searle reference discloses a three-phase motor having four bobbins associated with each phase. See Searle, Fig. 10. However, it cannot be said that Searle teaches, discloses, or suggests winding one segment of four segments separately from the other two remaining sets of four segments. The Searle reference discloses a bobbin chain or strip comprising a plurality of bobbins 2 connected by at least one and preferably two or more stringers or links 4. See Searle, col. 3, lines 14-17. The Searle reference also discloses a coil winding machine 28 adapted to wind a strand of wire 30 around each bobbin 2 so as to form a coil 32. See Searle, col. 4, lines 8-14. The winding machine 28 is adapted to wind the wire around one of the terminal pins 18 of a bobbin 2 at the beginning of each coil winding operation and around the other of the two terminal pins at the end of the same coil winding operation. See Searle, col. 4, lines 14-21. However, the Searle reference also discloses that the wire is severed at the end of each coil winding operation so that the bobbin strip is free to be advanced to replace the newly wound bobbin with the next empty bobbin. See Searle, col. 4, lines 14-21.

Furthermore, adjacent bobbins in the Searle reference are not connected to the same phase as the preceding coil. In an electromechanical device, such as a stator of a motor, adjacent coils are electrically connected to different phases. This is illustrated in Fig. 10 of the Searle reference, where the four "A phase" coils 32 are disposed around the stator, and not adjacent to each other. See Searle, col. 6, line 53-col. 7, line 29. The "A phase," "B phase," and "C phase" coils are disposed sequentially around the stator. See Searle, col. 6, line 53-col. 7, line 29. Thus, no two coils of the same phase are located adjacent to each other in the motor of the Searle reference. Furthermore, the groups of coils comprising each phase are not wound with a single continuous length of wire for each set such that the segments of each set are electrically in series.

The suggestion by the Examiner that the Searle reference can be said to wind the coils of one phase separately from the coils of the other two phases is conjecture and is not supported by the Searle reference. As discussed above, the Searle reference discloses

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that the wire is severed at the end of each coil winding operation so that the bobbin strip is free to be advanced to replace the newly wound bobbin with the *next empty bobbin*. See Searle, col. 4, lines 14-21. The Searle reference simply does not teach, disclose, or suggest jumping from bobbin to bobbin around the bobbin strip to wind each of the bobbins of a single phase, rather than a sequential operation from bobbin to bobbin around the bobbin strip. In addition, the cited references do not teach, disclose, or suggest "sets of segments being wound with a single continuous length of wire for each set such that the segments of each set are electrically in series." Thus, the cited references, either alone or in combination, do not teach, disclose, or suggest all of the recited features of independent claim 2.

Other exemplary recited features of claim 2 that are not taught, disclosed, or suggested by the cited references, either alone or in combination, are:

- (1) arranging a plurality of segments in a side-by-side orientation along a central axis, the plurality of segments forming one of the N sets of segments;
- (2) winding the plurality of segments about the central axis;
and
- (3) repeating steps (1) and (2) for each of the remaining sets of segments; and

In the Official Action, the Examiner stated that:

Varley teaches that multiple segments (formers 3) can be arranged in a side-by-side orientation along a common, centerline axis of rotation (centerline of shaft 2 shown in Fig. 7) for the purpose of winding a plurality of segments. The benefits of such side-by-side winding process allow the segments to be accurately formed with any desired gage of wire (see page 1 of disclosure, lines 70-75).

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The Varley reference discloses a spindle 2 carrying mandrels or formers 3. See Varley, page 2, lines 96-103. However, the coils of the Varley reference are not "the plurality of segments forming one of the N sets of segments", where each set of stator segments corresponds to a phase of the electromechanical device and each set of segments is wound with a single continuous length of wire for each set such that the segments of each set are electrically in series. Rather, each of the mandrels or formers 3 is used to form a single coil. See Varley, page 6, lines 97-106. The Varley reference does not teach, disclose, or suggest that any of the coils are electrically coupled together. Thus, the cited references do not teach, disclose, or suggest: "arranging a plurality of segments in a side-by-side orientation along a central axis, *the plurality of segments forming one of the N sets of segments*." For all of these reasons, the cited references, either alone or in combination, do not teach, disclose, or suggest all of the recited features of independent claim 2.

Furthermore, there is no suggestion to combine the references. When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

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In the Official Action, the Examiner stated that:

Varley teaches that multiple segments (formers 3) can be arranged in a side-by-side orientation along a common, centerline axis of rotation (centerline of shaft 2 shown in Fig. 7) for the purpose of winding a plurality of segments. The benefits of such side-by-side winding process allow the segments to be accurately formed with any desired gage of wire (see page 1 of disclosure).

However, the solution supposedly disclosed by the Varley reference has nothing to do with any problem associated with the Searle reference. The Varley reference is concerned with the problems associated with interposing thick insulation between different layers of the winding of a transformer. See Varley, page 1, lines 59-65. However, the Searle reference discloses a method of manufacturing a motor, not a transformer, and there is no thick insulation disposed within layers of the windings during the manufacture of the motor of the Searle reference. Thus, there is no benefit provided by the method of the Varley reference to the method of manufacturing of the Searle reference. Therefore, there is no suggestion to combine the references.

For all of these reasons, independent claim 2 is patentable over the cited references. Claim 21, which depends from independent claim 2, is patentable by virtue of its dependence on claim 2, as well as by virtue of their own subject matter. Withdrawal of the rejection and allowance of the pending claims are respectfully requested.

Some of the recited features of independent claim 4 that are not taught, disclosed, or suggested by the cited references, either alone or in combination, are:

(C) winding each of the plurality of segments during step
(B) perpendicularly with respect to the axis to form the
segments electrically in series with one another.

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As discussed above, none of the cited references, either alone or in combination, teach, disclose, or suggest winding each of a plurality of segments to form the segments electrically in series with one another. Therefore, the cited references do not disclose all of the recited features of independent claim 4. In addition, for the reasons provided above, there is no suggestion to combine the references.

For all of these reasons, independent claim 4 is patentable over the cited references. Claims 5-8, which depend from independent claim 4, are patentable by virtue of their dependence on claim 4, as well as by virtue of their own subject matter. Withdrawal of the rejection and allowance of the pending claims are respectfully requested.

Second Rejection Under 35 U.S.C. § 103

Claims 7, 21, and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Searle in view of Varley, as applied to claims 2 and 4, and further in view of Japanese Patent Publication JP 60-182119 (hereinafter "JP-119").

Claims 7, 21, and 22 depend from independent claim 4. As discussed above, the Searle and Varley references fail to teach, disclose, or suggest all of the recited features of independent claim 4. The JP-119 reference does not obviate the deficiencies of the Searle and Varley references, because the combined references continue to fail in teaching, disclosing, or suggesting all of the recited features of independent claim 4. Furthermore, there is no suggestion to combine the references. Claims 7, 21, and 22 are patentable by virtue of their dependence from independent claim 4, as well as by virtue of their own subject matter. Withdrawal of the rejection and allowance of claims 7, 21, and 22 are respectfully requested.

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Third Rejection Under 35 U.S.C. § 103

Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Searle in view of Varley, as applied to claim 4, and further in view of Japanese Patent Publication JP 54-42112 (hereinafter "JP-112").

Claim 8 also depends from independent claim 4. As discussed above, the Searle and Varley references fail to teach, disclose, or suggest all of the recited features of independent claim 4. The JP-112 reference does not obviate the deficiencies of the Searle and Varley references. Furthermore, there is no suggestion to combine the references. Accordingly, claim 8 is patentable by virtue of its dependence from independent claim 4, as well as by virtue of its own subject matter. Withdrawal of the rejection and allowance of claim 8 is respectfully requested.

Fourth Rejection Under 35 U.S.C. § 103

Claim 23 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Searle in view of Japanese Patent Publication JP 54-42112.

Applicants respectfully traverse the rejection. Claim 23 is patentable because the cited references, either alone or in combination, do not teach, disclose, or suggest all of the recited features of the claim. Some of the recited features of claim 23 that are not taught, suggested, or disclosed by the cited references are:

23. A method of constructing a segmented wound member of an N phase electromechanical device, comprising:

(A) winding N sets of segments, each segment of the N sets defining a bobbin, the N sets of segments being wound with a single continuous length of wire for each set;

and

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(B) combining the N sets of segments in a common circular arrangement to form the wound member.

The cited references, alone or in combination, do not teach, disclose, or suggest winding a number of sets of coils, corresponding to the number of phases of the electromechanical device, with a single continuous length of wire for each set. As the Examiner noted, the Searle reference discloses three sets of four bobbins, each set of four bobbins corresponding to one of the three phases. However, the coils formed on the bobbin for each phase are not connected by a single continuous wire. See Searle, Fig. 10 and col. 6, line 53-col. 7, line 29. In fact, no two coils of the motor illustrated in Fig. 10 are wound with a single continuous wire. Furthermore, the Searle reference does not teach, disclose, or suggest combining the sets of segments wound with a single continuous length of wire in a common circular arrangement to form the wound member. Therefore, the cited references do not teach, disclose, or suggest all of the recited features of claim 23.

Furthermore, the Examiner has not provided any suggestion for the combination of the references. Withdrawal of the rejection and allowance of the claim are respectfully requested.

Attachments

Attached hereto is a marked-up version of the changes made to the drawings and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

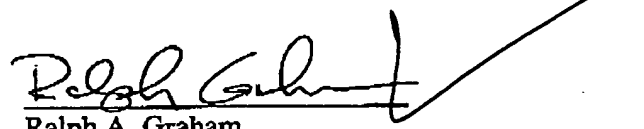
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Conclusion

In view of the above remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: August 22, 2002


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In response to the Official Action mailed on June 21, 2002, please amend the referenced patent application as follows:

IN THE CLAIMS

Please amend claims 2, 4, 6, and 21 as follows:

2. (Thrice Amended) A method of constructing a segmented wound member of an N phase electromechanical device, comprising:
- (A) winding N sets of stator segments, each set corresponding to a phase of the electromechanical device and each segment defining a bobbin, the N sets of segments being wound with a single continuous length of wire for each set such that the segments of each set are electrically in series, including
 - (1) arranging a plurality of segments in a side-by-side orientation along a central axis, the plurality of segments forming one of the N sets of segments;
 - (2) winding the plurality of segments about the central axis; and
 - (3) repeating steps (1) and (2) for each of the remaining sets of segments; and
 - (B) combining the N sets of segments in a common circular arrangement to form the wound member.
4. (Twice Amended) A method of winding segments of a segmented wound member of an electromechanical device, comprising:
- (A) arranging a plurality of segments in a side-by-side orientation along an axis of rotation, each segment of the plurality of segments defining a bobbin;

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(B) rotating ~~at least one of the~~ plurality of segments and a wire dispenser relative to each other about the axis of rotation; and

(C) ~~continuously winding each of the~~ plurality of segments during step (B) perpendicularly with respect to the axis to form the segments electrically in series with one another.

6. (Twice Amended) The method of claim 430, wherein the arranging, rotating, winding steps are performed N times, N being equal to a number of phases of the electromechanical device, and wherein a total of N sets of M segments are wound for the electromechanical device, M being determined by a number of poles of the electromechanical device and being equal to the number of segments that ~~are~~ are arranged, rotated, and wound during each performance of the arranging, rotating, and winding steps, and wherein the N sets of M segments are combined into the common circular arrangement.

21. (Twice Amended) The method of claim 2, wherein, during the rotating step (2), relative rotation between the plurality of segments and the wire ~~dispense~~ dispenser is established by virtue of the plurality of segments rotating and the wire dispenser remaining stationary.